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PRELIMINARY REPORT
INDUSTRY SERIES

1987
Census of
Manufactures

MC87-I-35D(P)
Issued May 1989

SPECIAL INDUSTRY MACHINERY, EXCEPT METALWORKING MACHINERY

Industries 3552, 3553, 3554, 3555, 3556, and 3559

INTRODUCTION

This report presents preliminary statistics from the 1987 Census of Manufactures for those establishments classified in the industries listed above. These data will be superseded by a more comprehensive final paperbound report. The method of data collection and use of administrative data are discussed in detail in the appendix.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The definitions of these industries are the same as those used in the 1987 Standard Industrial Classification (SIC) Manual.¹

INDUSTRY 3552, TEXTILE MACHINERY

In the 1987 Census of Manufactures, Industry 3552, Textile Machinery, had employment of 15.4 thousand. The employment figure was 21 percent below the 19.4 thousand reported in 1982.

The total value of shipments for establishments classified in this industry was \$1.2 billion. The products primary to this industry appear in table 2 and aggregated to \$1.1 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$542.9 million in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3553, WOODWORKING MACHINERY

In the 1987 Census of Manufactures, Industry 3553, Woodworking Machinery, had employment of 8.9 thousand.

The total value of shipments for establishments classified in this industry was \$946.0 million. The products primary to this industry appear in table 2 and aggregated to \$795.1 million in 1987.

The cost of materials and services used by establishments in this industry amounted to \$463.9 million in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3554, PAPER INDUSTRIES MACHINERY

In the 1987 Census of Manufactures, Industry 3554, Paper Industries Machinery, had employment of 17.1 thousand. The employment figure was 4 percent below the 17.8 thousand reported in 1982. Compared with 1986, employment in 1987 increased 11 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was \$1.9 billion. The products primary to this industry appear in table 2 and aggregated to \$1.6 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$883.6 million in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3555, PRINTING TRADES MACHINERY

In the 1987 Census of Manufactures, Industry 3555, Printing Trades Machinery, had employment of 25.7 thousand.

¹Standard Industrial Classification Manual: 1987. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Address inquiries to Bureau of the Census, Industry Division, Washington, DC 20233, or call **Raphael Corrado** (301) 763-7304.



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The total value of shipments for establishments classified in this industry was \$2.9 billion. The products primary to this industry appear in table 2 and aggregated to \$2.6 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$1.3 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3556, FOOD PRODUCTS MACHINERY

In the 1987 Census of Manufactures, Industry 3556, Food Products Machinery, had employment of 19.5 thousand.

The total value of shipments for establishments classified in this industry was \$2.0 billion. The products primary to this industry appear in table 2 and aggregated to \$1.8 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$848.6 million in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3559, SPECIAL INDUSTRY MACHINERY, N.E.C.

In the 1987 Census of Manufactures, Industry 3559, Special Industry Machinery, N.E.C., had employment of 80.5 thousand.

The total value of shipments for establishments classified in this industry was \$7.9 billion. The products primary to this industry appear in table 2 and aggregated to \$7.7 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to \$3.4 billion in 1987. Data on specific materials consumed appear in table 3.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in the tables in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.
n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

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Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Table 1. Historical Statistics for the Industry: 1987 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix]

Year ¹	Com-panies ² (no.)	All establishments ³		All employees		Production workers			Value added by manufac-ture ⁴ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expendi-tures (million dollars)	End-of-year inven-tories ⁴ (million dollars)	Ratios	
		Total (no.)	With 20 employ-ees or mora (no.)	Number (1,000)	Payroll (million dollars)	Numbar (1,000)	Hours (millions)	Wages (million dollars)						Spe-cial-ization (per-cent)	Cover-age (per-cent)
INDUSTRY 3552, TEXTILE MACHINERY															
1987 Census ----	(NA)	500	168	15.4	349.1	10.5	22.0	204.2	705.9	542.9	1 230.9	32.6	316.2	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	15.8	331.7	10.7	21.6	195.3	669.3	478.4	1 132.2	22.1	311.1	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	16.2	316.9	10.9	21.5	184.9	543.0	451.0	1 019.8	29.2	269.0	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	17.7	340.1	11.9	23.4	195.3	627.8	485.6	1 089.3	24.3	306.7	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	17.5	324.3	12.0	23.4	188.4	534.5	454.7	1 038.2	*35.4	267.0	(NA)	(NA)
1982 Census ----	511	551	197	19.4	322.9	12.8	23.9	184.5	641.6	424.1	1 059.0	46.1	298.7	96	95
1981 ASM -----	(NA)	(NA)	(NA)	22.9	366.5	15.7	30.8	214.6	776.7	472.1	1 245.0	38.4	279.9	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	24.3	352.2	16.8	33.7	210.7	715.3	477.6	1 170.5	33.0	262.6	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	24.1	323.4	16.8	32.7	195.2	656.8	413.6	1 055.2	33.2	240.2	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	25.0	320.4	16.8	32.9	178.5	559.5	428.0	996.1	*50.1	240.3	(NA)	(NA)
1977 Census ----	599	638	217	25.9	300.8	18.3	36.3	185.3	539.4	388.9	950.0	32.2	233.5	93	94
1976 ASM -----	(NA)	(NA)	(NA)	28.5	315.9	20.7	40.9	195.9	580.1	412.6	1 006.0	28.3	266.4	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	28.6	288.4	19.8	39.4	172.4	555.9	387.7	949.2	27.4	287.2	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	35.2	337.7	25.8	53.5	210.9	667.6	439.1	1 082.4	37.7	326.1	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	33.0	292.6	23.9	48.5	183.7	564.1	364.9	910.2	27.4	271.1	(NA)	(NA)
1972 Census ----	535	579	225	32.7	271.0	23.3	47.5	168.5	487.9	340.2	823.7	27.6	231.0	94	96
INDUSTRY 3553, WOODWORKING MACHINERY ⁶															
1987 Census ----	(NA)	287	97	8.9	204.7	5.8	11.7	115.4	485.8	463.9	946.0	17.0	160.6	(NA)	(NA)
INDUSTRY 3554, PAPER INDUSTRIES MACHINERY															
1987 Census ----	(NA)	271	127	17.1	500.7	9.7	20.0	240.5	1 045.4	883.6	1 900.5	46.0	408.6	(NA)	(NA)
1986 ASM -----	(NA)	(NA)	(NA)	15.4	448.9	8.7	17.4	215.9	706.0	860.6	1 630.7	*37.8	341.2	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	15.6	442.6	8.9	17.6	221.4	792.9	654.3	1 408.2	40.6	382.8	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	15.4	392.8	8.5	16.9	190.8	731.7	566.2	1 274.3	22.6	331.2	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	14.1	352.0	7.1	13.7	166.8	596.4	497.5	1 150.8	15.7	296.6	(NA)	(NA)
1982 Census ----	231	253	126	17.8	405.8	10.0	20.2	201.5	762.6	622.5	1 387.4	29.4	360.3	89	93
1981 ASM -----	(NA)	(NA)	(NA)	19.1	404.4	10.8	21.6	203.8	685.3	674.0	1 382.3	45.6	357.0	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	19.6	385.0	11.3	22.7	197.7	651.2	671.6	1 322.9	55.6	377.8	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	19.5	349.7	11.1	22.0	181.3	641.1	601.6	1 207.6	33.2	373.6	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	17.2	285.5	10.1	19.5	142.9	567.7	438.8	938.9	26.3	284.7	(NA)	(NA)
1977 Census ----	193	213	103	16.4	247.5	9.3	18.8	123.8	464.9	357.8	826.9	17.2	220.2	84	90
1976 ASM -----	(NA)	(NA)	(NA)	18.0	251.7	10.6	21.1	131.5	445.2	413.9	869.3	19.9	229.9	(NA)	(NA)
1975 ASM -----	(NA)	(NA)	(NA)	18.7	233.0	11.5	22.2	123.9	409.4	385.4	790.6	16.1	241.7	(NA)	(NA)
1974 ASM -----	(NA)	(NA)	(NA)	19.4	226.4	12.0	25.3	124.1	386.2	372.7	723.8	29.5	234.5	(NA)	(NA)
1973 ASM -----	(NA)	(NA)	(NA)	16.6	187.8	9.9	19.5	96.9	340.8	239.3	535.0	14.9	165.6	(NA)	(NA)
1972 Census ----	203	218	109	15.3	159.0	9.0	18.6	80.8	254.0	193.7	447.8	8.3	115.1	85	86
INDUSTRY 3555, PRINTING TRADES MACHINERY ⁶															
1987 Census ----	(NA)	428	190	25.7	763.2	12.4	25.7	305.2	1 618.9	1 321.7	2 876.6	114.9	776.3	(NA)	(NA)
INDUSTRY 3556, FOOD PRODUCTS MACHINERY ⁶															
1987 Census ----	(NA)	508	221	19.5	497.9	12.0	23.1	260.7	1 161.5	849.6	2 009.4	47.7	467.3	(NA)	(NA)
INDUSTRY 3559, SPECIAL INDUSTRY MACHINERY, N.E.C. ⁶															
1987 Census ----	(NA)	2 454	788	80.5	2 212.7	44.5	88.9	1 019.4	4 522.3	3 444.3	7 937.4	207.3	1 915.1	(NA)	(NA)

Note: Establishments of single unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. Data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were estimated based on administrative-record information from other agencies in conjunction with industry averages. These establishments accounted for the following percent of total value of shipments: SIC 3552, 11%; SIC 3553 15%; SIC 3554, 6%; SIC 3555, 9%; SIC 3556, 15%; and SIC 3559, 12%.

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the Industry chapter.

²For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during year.

⁴Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

⁵Estimates for new capital expenditures have associated standard error of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.

⁶Industry definition is new for 1987 Census of Manufactures. An explanation of the Standard Industrial Classification revision will appear in the final industry series text that supersedes this report.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3552- --	TEXTILE MACHINERY						
	Total	(NA)	(X)	1 096.7	(NA)	(X)	965.5
35521 --	Textile machinery	(NA)	(X)	511.9	(NA)	(X)	454.3
	Fiber-to-fabrics textile machinery (except parts, attachments, and accessories):						
35521 15	Cleaning and opening machinery, including picker, garnetting, and other	6	(S)	14.4	12	*5 042	16.7
35521 25	Carding machines and combing machines	5	(S)	20.7	6	(D)	(³)
35521 36	Drawing and roving frames	2	(D)	(D)	3	410	19.0
35521 38	Spinning and twisting frames:						
35521 39	Frames	3	(D)	(D)	4	(S)	11.0
	Spindles	no. of spindles..	(X)	(D)	(X)	(S)	(X)
35521 51	Yarn preparing machines: Winding machines (skein, spool, bobbin, quill, cone, etc.)	6	2 856	14.5	10	4 767	23.3
35521 53	Other yarn preparing machines (beaming, warping, warp tying, warp drawing in, slashing, etc.)	9	(S)	38.3	6	(S)	*50.7
35521 54	Other fiber-to-fabrics machinery: Machines for extruding, drawing, or cutting manmade textile fibers	8	(S)	84.4	8	542	30.2
35521 56	Other	5					
	Fabrics machinery (except parts, attachments, and accessories):						
35521 68	Weaving machinery, power-driven (including machinery for broad and narrow fabrics):						
35521 69	Shuttle	1	(D)	(D)	5	(S)	9.2
35521 71	Shuttleless	-					
35521 81	Knitting machinery	5	(S)	36.8	8	(S)	20.7
35521 82	Other fabrics machinery, including lace, embroidery, braiding, and tufting machinery and hand looms	15	(S)	51.1	17	5 824	36.9
35521 83	Bleaching, Mercerizing, and dyeing machinery	8	(S)	48.9	9	(S)	26.9
35521 84	Printing machinery	6	(S)	15.0	6	916	14.0
35521 85	Finishing machinery: Calendering or rolling machines	4					
35521 86	Other	20	(S)	57.6	30	(S)	78.0
35521 87	Machinery for drying stocks, yarns, cloth, carpet, nonwoven, etc.	18	(S)	34.1	18	(S)	25.9
35521 98	Other textile industries machinery, n.e.c. (except parts, attachments, and accessories)	31	(S)	62.5	43	(S)	74.4
35521 00	Textile machinery, n.s.k.	(NA)	(X)	19.2	(NA)	(X)	17.4
35522 --	Parts and attachments for textile machinery	(NA)	(X)	433.6	(NA)	(X)	390.0
35522 11	Textile machinery turnings and shapes (bobbins, shuttles, spools, picker sticks, cops, etc.)	15	(X)	36.8	16	(X)	40.2
	Parts and attachments: Fiber-to-fabrics machinery:						
35522 22	Card clothing	8	(S)	34.0	7	1 293.5	20.6
35522 31	Other fiber-to-fabrics machinery, except card clothing	37	(X)	113.2	23	(X)	81.2
35522 43	Weaving machines, including broad and narrow fabrics	19	(X)	67.9	24	(X)	101.9
35522 45	Knitting machines, excluding needles	17	(X)	22.5	12	(X)	12.2
35522 74	Finishing machinery	28	(X)	39.7	22	(X)	19.5
35522 79	Other textile machinery, including printing	65	(X)	90.8	87	(X)	93.5
35522 00	Parts and attachments for textile machinery, n.s.k.	(NA)	(X)	28.7	(NA)	(X)	20.8
35520 --	Textile machinery, n.s.k.	(NA)	(X)	151.2	(NA)	(X)	121.3
35520 00	Textile machinery, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	105.4	(NA)	(X)	89.3
35520 02	Textile machinery, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	45.8	(NA)	(X)	32.0
3553- --	WOODWORKING MACHINERY						
	Total	(NA)	(X)	795.1	(NA)	(X)	*617.3
35533 --	Woodworking machinery (except machinery designed primarily for home workshops, garages, and service shops) (excluding chain saws and other power-driven handtools), including parts, attachments, and accessories	(NA)	(X)	450.8	(NA)	(X)	*288.2
	Sawmill equipment:						
35533 11	Saws (head rigs):						
35533 13	Circular	7	(S)	6.5	8	**1 179	9.8
35533 15	Bend	7	(S)	19.3	14	(S)	22.8
35533 19	Other sawmill equipment, except saws (head rigs)	21	(X)	80.1	22	(X)	33.0
35533 21	Sawing machines, except sawmill equipment	19	(S)	64.3	15	6 066	26.5
35533 23	Planing machinery, including single and double planers, facers, jointers, and abrasive planers	11	(S)	21.5	(NA)	(NA)	(⁵)
35533 25	Sanding machines	11	(S)	28.9	(NA)	(NA)	(⁵)
35533 27	Boring machines	3	(S)	2.1	(NA)	(NA)	(⁵)
35533 29	Mortising and tenoning machines	4	(S)	5.4	(NA)	(NA)	(⁵)
35533 31	Lathes or turning machines	6	(D)	(D)	(NA)	(NA)	(⁵)
35533 33	Moulders	3	(D)	(D)	(NA)	(NA)	(⁵)
35533 35	Routers	5	(S)	8.4	(NA)	(NA)	(⁵)
35533 37	Assembling, gluing, laminating, and finishing machines	9	(S)	16.9	(NA)	(NA)	(⁵)
35533 39	Multifunction machines	6	(S)	14.3	(NA)	(NA)	(⁵)
35533 41	Other machines and equipment	32	(S)	89.0	(NA)	(X)	*129.5
35533 43	Parts, attachments, and accessories for woodworking machinery (sold separately), excluding saw blades and cutting tools	51	(X)	57.2	52	(X)	58.7
35533 00	Woodworking machinery, excluding home workshop and power-driven handtools, n.s.k.	(NA)	(X)	5.4	(NA)	(X)	7.9

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3553--	WOODWORKING MACHINERY—Con.						
35534 --	Woodworking machinery designed primarily for home workshops, garages, and service shops (excluding chain saws and other power-driven handtools) -----	(NA)	(X)	191.8	(NA)	(X)	4262.8
	Saws: -----						
35534 01	Circular ----- thousands -----	5	*779.2	123.1	5	702.1	132.4
35534 02	Bend ----- do -----	4					
35534 03	Other ----- do -----	3					
35534 04	Lathes, including boring lathes ----- do -----	2	(S)	40.5	11	255.8	84.7
35534 05	Planing, milling, or moulding machines, except lathes ----- do -----	3					
35534 06	Drill presses ----- do -----	2					
35534 07	Mortising and tenoning machines ----- do -----	1	4	28.0	7	(X)	441.0
35534 08	Sanding, grinding, or polishing machines ----- do -----	4					
35534 09	Other machines and equipment, including multifunction ----- do -----	2					
35534 11	Parts, attachments, and accessories for woodworking machines designed primarily for home workshops, etc., (sold separately) except parts for power-driven handtools (excluding saw blades and cutting tools) -----	5	(X)	28.0	7	(X)	441.0
35534 00	Woodworking machinery designed primarily for home workshops, garages, and service shops (excluding chain saws and other power-driven handtools), n.s.k. -----	(NA)	(X)	-	(NA)	(X)	4.5
35530 --	Woodworking machinery, n.s.k. -----	(NA)	(X)	152.5	(NA)	(X)	88.5
35530 00	Woodworking machinery, n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	116.7	(NA)	(X)	52.0
35530 02	Woodworking machinery, n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	35.8	(NA)	(X)	14.5
3554--	PAPER INDUSTRIES MACHINERY						
	Total -----	(NA)	(X)	1 612.4	(NA)	(X)	1 199.0
35543 --	Paper industries machinery -----	(NA)	(X)	924.5	(NA)	(X)	9870.7
35543 01	Wood preparation equipment, including debarkers, chippers, knotters, splitters, chipscreens, etc. -----	5	(X)	53.1	11	(X)	936.5
	Pulp mill machinery: -----						
35543 02	Grinders and refiners (TMP) for the manufacture of mechanical pulp -----	4	(X)	18.8	4	(D)	(7)
35543 03	Digesters and other equipment for the manufacture of chemical pulp -----	5	(X)	24.1	(NA)	(X)	(8)
35543 04	Deckers, thickeners, wet lap machines, bleaching equipment, pulp screens, washers, and save-alls -----	6	(X)	23.4	14	(X)	937.5
35543 05	Other pulp mill machinery -----	11	(X)	22.3	11	(X)	982.8
	Paper mill machinery: -----						
35543 09	Stock preparation equipment: refiners (chip, conical, deflaker, disk, etc.), pulpers, beaters, jordan, etc. -----	7	(X)	46.2	7	(X)	954.6
	Paper machines: -----						
35543 11	Paper making machines, including headbox forming area, presses, dryers, and reels -----	11	(X)	158.7	(NA)	(X)	(9)
35543 12	Coating machines, including equipment for applying sizing or pigment coating to paper -----	5	(X)	12.5			
35543 13	Calendering and similar rolling machines for finishing paper ----- number -----	8	(S)	38.1			
35543 14	Machines for finishing paper, except calendering or similar rolling (including winders, rewinders, sheeters, wrappers, etc.) -----	14	(X)	68.2	24	(X)	9277.8
35543 15	Other paper machines -----	6	(X)	36.8			
	Paper and paperboard converting equipment: -----						
35543 21	Cutting machines, except sheeters and winders ----- number -----	11	(S)	21.1	(NA)	(NA)	(10)
35543 22	Machines for making bags, sacks, or envelopes -----	6	(X)	19.7	9	(S)	921.4
35543 23	Corrugated box making machines ----- number -----	11	**566	83.3	15	737	983.3
35543 24	Machines for making cartons, boxes, cases, tubes, drums, or similar containers, except by molding (excluding corrugated box making machines) -----	11	(X)	92.4	12	(X)	957.8
35543 25	Machines for molding articles in paper pulp, paper, or paperboard -----	2					
35543 26	Other paper and paperboard converting equipment, including folding, gluing, laminating, gumming, scoring, sandpapering, toilet roll making, towel roll making, tissue making, etc. -----	39	(X)	195.8	54	(X)	9202.0
35543 00	Paper industries machinery, n.s.k. -----	(NA)	(X)	32.1	8	(X)	917.2
35544 --	Parts and attachments for paper industries machinery (sold separately) -----	(NA)	(X)	517.4	(NA)	(X)	9258.9
35544 01	Parts and attachments for wood preparation equipment (sold separately) -----	4	(X)	97.4	16	(X)	48.3
35544 02	Parts and attachments for pulp mill machinery (sold separately) -----	17					
35544 03	Parts and attachments for machines for finishing paper (sold separately) -----	15	(X)	58.8	31	(X)	74.5
35544 04	Parts and attachments for paper mill machinery, except machines for finishing paper (sold separately) -----	29	(X)	213.4			
35544 05	Parts and attachments for paper and paperboard converting equipment (sold separately) -----	42	(X)	133.5			
35544 00	Parts and attachments for paper industries machinery (sold separately), n.s.k. -----	(NA)	(X)	14.6	(NA)	(X)	3.8
35540 --	Paper industries machinery, n.s.k. -----	(NA)	(X)	170.5	(NA)	(X)	89.4
35540 00	Paper industries machinery, n.s.k., typically for establishments with 20 employees or more (see note) -----	(NA)	(X)	110.3	(NA)	(X)	42.8
35540 02	Paper industries machinery, n.s.k., typically for establishments with less than 20 employees (see note) -----	(NA)	(X)	60.2	(NA)	(X)	28.8

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3555--	PRINTING TRADES MACHINERY						
	Total	(NA)	(X)	2 573.2	(NA)	(X)	¹¹ 971.8
35551 --	Printing presses, offset lithographic	(NA)	(X)	748.2	(NA)	(X)	665.0
35551 02	Sheet-fed						
	complete presses	7	(S)	59.8	9	(S)	48.2
35551 33	Roll-fed (web-fed): Business forms						
	complete presses	6		71.2	9	*299	72.3
35551 35	Commercial (including heat-set) web	10		363.5	8	(D)	⁽¹²⁾
35551 32	Newspaper	8	^{*1} 532	229.0	7	(D)	⁽¹²⁾
35551 36	All other	6	(S)	23.0	7	(S)	¹²⁵ 42.1
35551 00	Printing presses, offset lithographic, n.s.k.	(NA)	(X)	1.7	(NA)	(X)	2.4
35552 --	Printing presses, other than lithographic	(NA)	(X)	171.5	(NA)	(X)	148.9
35552 01	Letterpress (typographical, relief)						
	complete presses	4	(D)	(D)	10	*327	6.6
35552 37	Gravure, sheet-fed and web-fed (roll-fed)	3	(D)	(D)	6	(S)	16.7
35552 38	Flexographic, sheet-fed and web-fed (roll-fed)	9	(S)	72.4	13	¹ 223	41.1
35552 41	Other printing presses, including metal decorating, proof, and rebuilt	13	(S)	86.9	28	(S)	71.7
35552 00	Printing presses, other than lithographic, n.s.k.	(NA)	(X)	4.1	(NA)	(X)	12.8
35553 --	Typesetting machinery (excluding justifying typewriters)	(NA)	(X)	350.3	(NA)	(X)	303.4
	Photographic typesetting machines, including integral computer:						
35553 03	CRT, including laser phototypesetters	5	(S)	195.5	7	(S)	120.1
35553 05	Other	3	(D)	(D)	6	(S)	151.9
35553 08	Input editing machines (processing systems)	2	(D)	(D)	3	(S)	20.6
35553 09	Other typesetting machines	1	(D)	(D)	5	(S)	9.5
35553 00	Typesetting machinery (excluding justifying typewriters), n.s.k.	(NA)	(X)	-	(NA)	(X)	1.2
35556 --	Binding machinery and equipment (including paper cutting and collating or gathering machines)	(NA)	(X)	268.9	(NA)	(X)	171.6
35556 61	Saddle, perfect, and hard case (edition) binding equipment	6	(S)	105.9	6	(S)	57.1
35556 66	Paper cutting machines	8	(S)	21.6	9	(S)	12.3
35556 67	Collating and/or gathering machines (sold separately)	17	(S)	57.1	8	^{*1} 297	42.7
35556 65	Other binding machinery and equipment, including folding equipment	20	(S)	84.3	21	(S)	59.0
35556 00	Binding machinery and equipment, n.s.k.	(NA)	(X)	-	(NA)	(X)	.5
35558 --	Other printing trades machinery (including parts, attachments, and accessories for printing trades machinery and equipment) (excluding roll coverings and printers' blankets)	(NA)	(X)	742.3	(NA)	(X)	¹¹ 13567.0
	Pre-press preparatory equipment (excluding typesetting equipment and cameras):						
35558 02	Photocomposing equipment	4	(S)	29.2	20	(S)	37.3
35558 09	Other pre-press preparatory equipment	13	(S)	48.3			
35558 69	Engravers' materials and equipment, including metal plates, etc.	11	(X)	76.0	15	(X)	40.1
35558 83	Parts, attachments, and accessories for printing presses (sold separately), including flying pasters, dryers, folders, and reels	62	(X)	264.7	57	(X)	295.7
35558 85	Parts, attachments, and accessories for typesetting machines (sold separately)	10	(X)	86.1	6	(X)	18.1
35558 87	Parts, attachments, and accessories for bindery equipment (sold separately)	10	(X)	14.9	9	(X)	6.9
35558 89	Parts, attachments, and accessories for other printing trades machinery and equipment (sold separately)	35	(X)	57.4	31	(X)	44.0
35558 99	Other printing trades machinery and equipment, including plates (except typewriter)	29	(X)	115.2	43	(X)	72.9
35558 00	Other printing trades machinery (including parts, attachments, and accessories for printing trades machinery and equipment), n.s.k.	(NA)	(X)	50.5	(NA)	(X)	¹³ 52.0
35550 --	Printing trades machinery, n.s.k.	(NA)	(X)	292.0	(NA)	(X)	116.0
35550 00	Printing trades machinery, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	242.4	(NA)	(X)	71.4
35550 02	Printing trades machinery, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	49.6	(NA)	(X)	44.6
3556--	FOOD PRODUCTS MACHINERY						
	Total	(NA)	(X)	¹⁴¹ 770.3	(NA)	(X)	¹⁴¹ 400.1
35561 --	Dairy and milk products plant machinery and equipment, except bottling and packaging machinery	(NA)	(X)	262.3	(NA)	(X)	176.4
35561 02	Pasteurizers and sterilizers	3	(D)	(D)	8	¹⁵ 27 122	¹⁵ 96.1
35561 05	Ice cream freezers	7	^{**39} 430	155.5			
35561 06	Butter and cheese processing plant machinery and equipment	7	(S)	18.0	10	(S)	16.8
35561 07	Dry milk processing plant machinery and equipment	3	(D)	(D)	4	395	10.4
35561 08	Irradiators	-	-	-	(NA)	(NA)	⁽¹⁶⁾
35561 09	Homogenizers	3	(S)	19.6	(NA)	⁽¹⁵⁾	⁽¹⁶⁾
35561 11	Cream separators	1	(D)	(D)	(NA)	(NA)	⁽¹⁶⁾
35561 19	Other dairy and milk products plant machinery and equipment	7	(S)	19.3	(NA)	(S)	¹⁵ 1653.1
35561 21	Parts and attachments for dairy and milk products plant machinery and equipment	8	(X)	11.5	(NA)	(NA)	⁽¹⁶⁾
35561 00	Dairy and milk products plant machinery and equipment, except bottling and packaging machinery, n.s.k.	(NA)	(X)	.5	(NA)	(X)	-

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3556--	FOOD PRODUCTS MACHINERY—Con.						
35562 --	Commercial food products machinery, except packaging machinery and food cooking and warming equipment	(NA)	(X)	601.6	(NA)	(X)	479.7
35562 11	Slicers thousands	16	(S)	138.1	21	(S)	58.2
35562 21	Choppers, grinders, cutters, dicers, and similar machines	22	(S)	117.0	27	*84.3	109.3
35562 31	Mixers and whippers, except drink mixers	14	(S)	113.9	12	(S)	37.1
35562 65	Industrial bakery machinery and equipment: Dough mixers, dividers, and molders number	13	(S)	32.9	8	17 *1 374	1712.4
35562 71	Bake ovens: Traveling tray number	2	]	38.5	6	1 076	11.3
35562 75	Other do	9			13	**3 084	37.7
35562 85	Pastry rolling machines do	2			(NA)	(NA)	(18)
35562 91	Other bakery machinery and equipment do	27			36	(S)	17 186.7
35562 41	Other commercial food preparation machines, including tenderizers (power-driven)	18	(X)	22.5	33	(X)	68.4
35562 51	Parts and attachments for commercial food preparation machines	24	(X)	45.8	29	(X)	34.3
35562 00	Commercial food products machinery, except packaging machinery and food cooking and warming equipment, n.s.k.	(NA)	(X)	14.7	(NA)	(X)	24.3
35563 --	Industrial machinery and equipment for manufacturing or processing foods, beverages (except dairy products), and animal or fowl feed (excluding packaging and bottling machinery and farm machinery)	(NA)	(X)	551.1	(NA)	(X)	19585.6
35563 01	Machinery for working cereals or dried leguminous materials: Cleaning, sorting, or grading machinery number	9	(S)	9.9	(NA)	(NA)	(20)
35563 02	Flour and grain mill machinery do	3	(S)	1.8	18	(X)	38.0
35563 03	Other machinery for working cereals or dried leguminous materials do	7	(S)	11.6	(NA)	(NA)	(20)
35563 04	Presses, crushers, and similar machinery used in the production of wine, cider, fruit juices, and similar beverages do	6	(S)	37.1	(NA)	(NA)	(20)
35563 05	Machinery for sorting, grading, or cleaning fruits, vegetables, or eggs do	23	(S)	56.4	(NA)	(NA)	(20)
35563 06	Machinery for extraction or preparation of animal or vegetable fats or oils do	1	(D)	(D)	(NA)	(NA)	(20)
35563 07	Machinery, not specified above, for the manufacture of confectionery, cocoa, or chocolate do	2	(D)	(D)	(NA)	(NA)	(20)
35563 08	Sugar plant machinery, including cane and beet mills, crushers, pulverizers, crystallizers, granulators, etc.	7	(S)	12.1	12	(X)	46.9
35563 09	Brewery machinery, not specified above do	2	(D)	(D)	(NA)	(NA)	(20)
35563 11	Meat and poultry processing and preparation machinery and equipment (killing, dehairing, stuffing, cooking, rendering, etc.) do	37	(S)	149.1	41	(X)	131.5
35563 12	Machinery, not specified above, for the preparation of fruits, vegetables, and nuts do	20	(S)	53.1	(NA)	(NA)	(20)
35563 14	Machinery for the preparation of fish and shellfish do	3	(D)	(D)	(NA)	(NA)	(20)
35563 15	Other industrial food and feed products machinery do	39	**5 694	84.1	(NA)	(X)	20202.7
35563 21	Parts and attachments for industrial food products machinery do	48	(X)	71.1	57	(X)	19163.7
35563 00	Industrial machinery and equipment for manufacturing or processing foods, beverages (except dairy products), and animal or fowl feed (excluding packaging and bottling machinery and farm machinery), n.s.k.	(NA)	(X)	39.8	(NA)	(X)	2.8
35560 --	Food products machinery, n.s.k.	(NA)	(X)	355.2	(NA)	(X)	158.5
35560 00	Food products machinery, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	297.8	(NA)	(X)	92.1
35560 02	Food products machinery, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	57.4	(NA)	(X)	66.4
3559--	SPECIAL INDUSTRY MACHINERY, N.E.C.						
	Total	(NA)	(X)	7 704.0	(NA)	(X)	215 633.4
35591 --	Chemical manufacturing industries machinery, equipment, and parts	(NA)	(X)	703.5	(NA)	(X)	22641.3
35591 01	Distilling, rectifying, or fractionating do	6	(X)	29.4	]	114	22641.3
35591 03	Heat exchange units do	6	(X)	60.5			
35591 05	Dryers do	10	(X)	31.3			
35591 07	Gas or air liquefying machinery do	8	(X)	121.4			
35591 09	Mixing, kneading, crushing, grinding, sifting, homogenizing, emulsifying, or stirring machines do	39	(X)	157.1	]	(X)	22641.3
35591 11	Other chemical manufacturing machines and equipment do	46	(X)	170.6			
35591 13	Parts for distilling, rectifying, fractionating, heat exchange, dryers, gas or air liquefying machinery and equipment do	10	(X)	28.2			
35591 15	Parts for other chemical manufacturing machinery and equipment do	34	(X)	62.7			
35591 00	Chemical manufacturing machinery and equipment and parts, n.s.k.	(NA)	(X)	42.3	]	5	12.0
35592 --	Foundry machinery and equipment, excluding patterns and molds	(NA)	(X)	225.7	(NA)	(X)	260.0
35592 01	Foundry pouring equipment, including ladles, crucibles, and pouring machines do	13	(X)	25.8	6	(X)	29.6
35592 03	Molding machines: Green sand number	2]	11.0	6	114	12.0
35592 05	Other do	2			5	(S)	20.4

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Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

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1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3559--	SPECIAL INDUSTRY MACHINERY, N.E.C.—Con.						
35592 --	Foundry machinery and equipment, excluding patterns and molds—Con.						
35592 07	Blast cleaning machines (hydraulic, pneumatic, and airless) ----- number ..	7	(S)	59.7	10	(S)	84.7
35592 09	Converters ----- do ..	6	(S)	23.1	40	(S)	53.6
35592 11	Casting machines ----- do ..	19	(X)	51.5	19	(X)	47.4
35592 15	Other foundry machinery and equipment ----- do ..	20	(X)	45.7			
35592 19	Parts for foundry machinery and equipment ----- do ..	(NA)	(X)	9.0	(NA)	(X)	12.3
35592 00	Foundry machinery and equipment (excluding patterns and molds), n.s.k. ----- do ..						
35593 --	Plastics working machinery and equipment, excluding patterns and molds ----- do ..	(NA)	(X)	1 196.6	(NA)	(X)	785.7
35593 01	Compression molding machines ----- number ..	6	(S)	6.5	4	(S)	10.9
	Extrusion machines:						
35593 03	Single screw extruders:						
35593 05	Up to 2.49 in. screw diameter ----- number ..	12	(S)	17.0	13	(S)	22.5
35593 07	2.50 to 5.49 in. screw diameter ----- do ..	18	(S)	80.2	16	(S)	45.4
35593 09	5.50 in. screw diameter or larger ----- do ..	10	(S)	13.2	12	(S)	21.4
35593 11	Multiple screw extruders ----- do ..	4	(S)	22.6	5	*66	10.5
35593 13	Injection molding machines:						
35593 15	500 tons or less ----- number ..	23	(S)	196.5	22	(S)	132.4
35593 17	More than 500 tons ----- do ..	11	(S)	130.4	10	(S)	45.8
35593 19	Blow molding machines ----- do ..	9	(S)	97.3	13	(S)	53.9
35593 21	Granulators and pelletizers ----- do ..	12	(S)	42.4	15	(S)	48.1
35593 23	Thermoforming machines ----- do ..	12	(S)	65.8	7	*501	20.8
35593 25	Calendering or other rolling machines for working plastics ----- do ..	7	(X)	23.0			
35593 27	Machines for cold working plastics (drilling, milling, slicing, grinding, etc.) ----- do ..	9	(X)	12.4	83	(X)	204.0
35593 29	Other machinery for working plastics or making products from plastics ----- do ..	62	(X)	239.1			
35593 31	Parts for plastics working machinery:						
35593 33	Cylinders and other parts for calendering or other rolling machines ----- do ..	3	(X)	176.8	48	(X)	132.1
35593 35	For machines for cold working plastics ----- do ..	1					
35593 37	For other plastics working machinery ----- do ..	52					
35593 39	Plastics working machinery and equipment, excluding patterns and molds, n.s.k. ----- do ..	(NA)	(X)	73.4	(NA)	(X)	37.9
35594 --	Rubber working machinery and equipment, excluding tire molds ----- do ..	(NA)	(X)	202.2	(NA)	(X)	187.0
35594 01	High-intensity solids mixers ----- do ..	5	(X)	24.7	6	(X)	9.2
35594 03	Extruding machines ----- number ..	7	(S)	8.7	8	*222	14.9
35594 05	Tire building equipment, except tire molds ----- do ..	16	(X)	48.2	15	(X)	60.0
35594 07	Tire recapping and repairing machinery and equipment, including recapping vulcanizers ----- do ..	6	(X)	36.3	10	(X)	29.0
35594 09	Calendering or other rolling machines for working rubber ----- do ..	2					
35594 11	Machines for cold working rubber (drilling, milling, slicing, grinding, etc.) ----- do ..	1	(X)	42.4	22	(X)	42.5
35594 13	Other machinery for working rubber or making products of rubber ----- do ..	16					
35594 15	Parts for rubber working machinery:						
35594 17	Cylinders and other parts for calendering or other rolling machines ----- do ..	3	(X)	(²³)	14	(X)	24.5
35594 19	For machines for cold working rubber ----- do ..	1	(X)	2326.6			
35594 21	For other rubber working machinery ----- do ..	13	(X)				
35594 23	Rubber working machinery and equipment, excluding tire molds, n.s.k. ----- do ..	(NA)	(X)	15.2	(NA)	(X)	6.9
35596 --	Semiconductor manufacturing equipment (except furnaces and ovens, instruments, and photographs) ----- do ..	(NA)	(X)	1 056.5	(NA)	(X)	24615.3
	Wafer processing equipment:						
	Microlithography:						
35596 01	Aligners:						
35596 03	Contact/proximity ----- number ..	4			(NA)	(X)	(²⁵)
35596 05	Scan optical ----- do ..	1			(NA)	(X)	(²⁵)
35596 07	Step and repeat ----- do ..	2			(NA)	(X)	(²⁵)
35596 09	Other ----- do ..	3	(S)	45.9	(NA)	(X)	(²⁵)
35596 11	Other lithography systems:						
35596 13	E-beam direct writers ----- number ..	1			(NA)	(X)	(²⁵)
35596 15	E-beam mask makers ----- do ..	1			(NA)	(X)	(²⁵)
35596 17	Focused ion beam writers ----- do ..	1			(NA)	(X)	(²⁵)
35596 19	Thin layer deposition:						
35596 21	Chemical vapor deposition ----- number ..	7	(S)	113.6	(NA)	(X)	(²⁵)
35596 23	Physical vapor deposition ----- do ..	4	(S)	47.4	(NA)	(X)	(²⁵)
35596 25	Epitaxial growth ----- do ..	4			(NA)	(X)	(²⁵)
35596 27	Etch and strip:						
35596 29	Wet etch ----- number ..	10	(S)	42.9	(NA)	(X)	(²⁵)
35596 31	Plasma etch ----- do ..	9	(S)	191.9	(NA)	(X)	(²⁵)
35596 33	Reactive ion etch ----- do ..	2			(NA)	(X)	(²⁵)
35596 35	Stripping systems ----- do ..	4	*73	5.8	(NA)	(X)	(²⁵)
35596 37	Ion implantation:						
35596 39	Current ion implanters ----- number ..	3	(D)	(²⁶)	(NA)	(X)	(²⁵)
35596 41	Voltage ion implanters ----- do ..	1	(D)	(²⁵)	(NA)	(X)	(²⁵)
35596 43	Other wafer processing equipment ----- do ..	28	(S)	26271.7	(NA)	(X)	(²⁵)

See footnotes at end of table.

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1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3559—	SPECIAL INDUSTRY MACHINERY, N.E.C.—Con.						
35596 —	Semiconductor manufacturing equipment (except furnaces and ovens, instruments, and photographs)—Con. Assembly and packaging equipment:						
	Assembly:						
35596 35	Dicing:						
	Dicing saws	4	(S)	190.0	(NA)	(X)	(²⁵)
35596 37	Scribing/fracturing machines	3			(NA)	(X)	(²⁵)
	Bonding:	5					
35596 39	Die bonders	6			(NA)	(X)	(²⁵)
35596 41	Wire bonders	6			(NA)	(X)	(²⁵)
35596 43	Lead frame inserting machines	—			(NA)	(X)	(²⁵)
	Packaging:						
35596 45	Surface mounted (chip) placement machines (mold and seal)	2	(S)	28.7	(NA)	(X)	(²⁵)
35596 47	Finish and mark equipment	4			(NA)	(X)	(²⁵)
35596 49	Other assembly and packaging machinery	11	(S)	41.7	(NA)	(X)	(²⁵)
35596 51	Parts for semiconductor manufacturing machinery	28	(X)	69.8	(NA)	(X)	(²⁵)
35596 00	Semiconductor manufacturing equipment (except furnaces and ovens, instruments, and photographs), n.s.k.	(NA)	(X)	7.3	64	(X)	²⁵ 15.3
35597 —	Automotive maintenance equipment, except handtools	(NA)	(X)	373.6	(NA)	(X)	200.3
35597 01	Frame and body alignment (straightening) equipment	9	(X)	173.7	7	(X)	19.2
35597 02	Wheel alignment equipment	4	(X)		10	(X)	56.1
35597 03	Wheel balancing equipment	11	(X)	59.1	9	(X)	30.4
35597 04	Tire and wheel mounting equipment	4	(X)	36.9	5	(X)	54.6
35597 05	Brake service equipment	8	(X)	34.1			
35597 09	All other automotive maintenance equipment, except handtools	18	(X)	46.0	13	(X)	²⁷ 39.0
35597 11	Parts and attachments for automotive maintenance equipment, excluding handtools (sold separately)	6	(X)	13.5	(NA)	(X)	(²⁷)
35597 00	Automotive maintenance equipment, except handtools, n.s.k.	(NA)	(X)	10.4	(NA)	(X)	.9
35599 —	Special industry machinery and equipment, n.e.c.	(NA)	(X)	2 707.6	(NA)	(X)	^{21 242} 197.7
35599 01	Petroleum refining machinery	11	(X)	92.0	43	(X)	302.6
35599 03	Parts for petroleum refining machinery	13	(X)	37.2			
35599 05	Ammunition and explosive loading machinery	4	(X)	12.1			
35599 07	Parts for ammunition and explosive loading machinery	4	(X)	.9	9	(X)	34.5
35599 09	Tobacco processing machinery	8	(X)	22.1	13	(X)	39.6
35599 11	Parts for tobacco processing machinery	10	(X)	4.2			
	Machines for working stone, ceramics, brick, concrete, asbestos-cement, or like mineral materials or for cold working glass (except interchangeable cutting tools):						
35599 13	Sawing machines	3	(X)	5.3	(NA)	(X)	(²⁸)
	Grinding or polishing machines:						
35599 15	Glass working	7	(X)	53.5	(NA)	(X)	(²⁸)
35599 17	Other	7	(X)	8.4	(NA)	(X)	(²⁸)
	Other machines:						
35599 19	Glass working	8	(X)	22.8	(NA)	(X)	(²⁸)
35599 22	Other	7	(X)	8.8	(NA)	(X)	(²⁸)
35599 25	Other	10	(X)	9.6	(NA)	(X)	(²⁸)
35599 27	Parts	12	(X)	18.5	(NA)	(X)	(²⁸)
35599 29	Clay products forming equipment (brick, tile, ceramic)	6	(X)	16.2	(NA)	(X)	(²⁸)
	Concrete products forming equipment:						
35599 31	Concrete block equipment	4	(S)	28.1	7	(NA)	32.6
35599 33	Parts for concrete block equipment	2	(X)	⁽²⁹⁾			
35599 35	Other concrete products equipment	11	(X)	28.2			
35599 37	Parts for other concrete products equipment	6	(X)	²⁹ 52.7	22	(X)	56.3
35599 39	Cement making machinery	5	(X)	6.2	7	(X)	11.6
35599 41	Parts for cement making machinery	6	(X)	11.2			
35599 43	Glassmaking machinery and equipment, including machines for hot working glass or glassware	20	(X)	167.8	39	(X)	194.9
35599 45	Parts for glassmaking machinery and equipment	12	(X)	51.5			
	Machines for assembling electric or electronic lamps, tubes, or flashbulbs in glass envelopes:						
35599 47	Electron tube machines	—			(NA)	(NA)	(²⁸)
35599 49	Other machines	4	(D)	(D)	(NA)	(NA)	(²⁸)
35599 51	Parts	4	(X)	(D)	(NA)	(X)	(²⁸)
35599 53	Cotton ginning machinery	8	(S)	49.3	13	(NA)	58.1
35599 55	Parts for cotton ginning machinery	3	(X)	2.0			
35599 57	Fuel fired kilns for cement, wood, and chemical processing	8	(NA)	23.1	13	(NA)	21.2
35599 59	Parts for fuel fired kilns, for cement, wood, and chemical processing	3					
35599 61	Electroplating equipment (except rolling mill lines)	15	8.8	21.9	14	(X)	47.8
35599 63	Parts for electroplating equipment	8	(X)	5.9			
	Metal finishing equipment, except electroplating and rolling mill:						
35599 65	Vibratory finishing machines	4	(S)	10.9	(NA)	(NA)	(²⁸)
35599 67	Plating equipment	9	(S)	35.1	(NA)	(NA)	(²⁸)
35599 69	Other equipment	24	(S)	83.4	(NA)	(X)	(²⁸)
35599 71	Parts for metal finishing equipment	13	(X)	71.4	(NA)	(NA)	(NA)
35599 73	Metal degreasing machines	14	(NA)	28.7	17	(NA)	48.2
35599 75	Parts for metal degreasing machines	2					
35599 77	Desalination equipment	3	(D)	(D)	8	(X)	134.4
35599 79	Parts for desalination equipment	2	(X)	(D)			
35599 80	Isotopic separation machines or apparatus and parts thereof	—			(NA)	(NA)	(²⁸)

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3559--	SPECIAL INDUSTRY MACHINERY, N.E.C.—Con.						
35599 --	Special industry machinery and equipment, n.e.c.—Con.						
35599 81	Machinery for preparing, tanning, or working hides, skin, or leather ----- number -----	2	(D)	(D)	(NA)	(NA)	(28)
35599 82	Footwear manufacturing or repairing machinery ----- do -----	5			(NA)	(NA)	(28)
35599 83	Machinery for making articles of leather, except footwear ----- do -----	1	(NA)	19.4	(NA)	(NA)	(28)
35599 85	Parts of machines for preparing or making articles of leather and footwear manufacturing machines -----	4			(NA)	(X)	(28)
35599 86	Printed circuit board manufacturing machinery (except testing) ----- number -----	25	(S)	336.3	(NA)	(NA)	(28)
35599 87	Parts for printed circuit board manufacturing machinery (except testing) -----	11	(X)	74.7	(NA)	(X)	(28)
35599 88	Industrial sewing machine heads ----- thousands -----	8	(S)	21.8	8	*36.3	52.4
35599 89	Industrial sewing machinery, except heads -----	13	(X)	60.7	15	(X)	27.0
35599 90	Parts and attachments for industrial sewing machinery -----	17	(X)	75.9	(NA)	(X)	(30)
35599 92	Machines for working horn, bone, ivory, and similar hard materials (except metallic, mineral, wood, rubber, or plastics materials) ----- number -----	-	-	-	(NA)	(NA)	(27)
35599 93	Parts for machines for working horn, bone, etc. -----	-	(X)	-	(NA)	(X)	(27)
35599 94	Machines for insulating electrical wire for cable ----- number -----	3			(NA)	(NA)	(27)
35599 95	Parts of machines for insulating electrical wire or cable -----	3	(NA)	11.4	(NA)	(X)	(27)
35599 96	Electric battery manufacturing machinery ----- number -----	8	(S)	16.2	(NA)	(NA)	(27)
35599 97	Parts for battery making machines -----	6	(X)	5.1	(NA)	(X)	(27)
35599 99	Special industry machinery not elsewhere classified and parts thereof -----	317	(X)	972.9	(NA)	(X)	281 072.0
35599 00	Special industry machinery and equipment, n.e.c., n.s.k. -----	(NA)	(X)	42.8	(NA)	(X)	64.5
35590 --	Special industry machinery, n.e.c., n.s.k. -----	(NA)	(X)	1 238.2	(NA)	(X)	546.2
35590 00	Special industry machinery, n.e.c., n.s.k., typically for establishments with 10 employees or more (see note) -----	(NA)	(X)	897.4	(NA)	(X)	415.2
35590 02	Special industry machinery, n.e.c., n.s.k., typically for establishments with less than 10 employees (see note) -----	(NA)	(X)	340.8	(NA)	(X)	131.0

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

- ¹Data reported by all producers, not just those with shipments of \$100,000 or more.
- ²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).
- ³For 1982, data for product code 35521 25 have been combined with product code 35521 53 to avoid disclosing data for individual companies.
- ⁴For 1982, data for product codes 3553-- --, 35533 --, 35534 --, and 35534 11 have been revised. These product codes were published in 1982 as 3553-- --, 35531 --, 35532 --, and 35532 81 and included cutting tools. For 1987, cutting tools for woodworking are classified in SIC industry 3423, Hand and Edge Tools, N.E.C.
- ⁵For 1982, product codes 35533 21, 35533 23, 35533 25, 35533 27, 35533 29, 35533 31, 35533 33, 35533 35, and 35533 37 were not collected separately but were included with product code 35533 39.
- ⁶For 1982, data for product codes 35543 -- and 35544 -- have been revised because rebuilt machines were moved from product code 35544 -- to 35543 -- in 1987. In 1982, product code 35543 -- was published as product code 35541 -- and product code 35544 -- as product code 35542 --. The 1982 data for rebuilt machines were published separately under former product code 35542 73 at 17 million dollars but were included in this report under product code 35543 00. Since rebuilt machines were not collected separately in 1987, but included in each individual product category, 1982 data for product codes 35543 01, 35543 04, 35543 05, 35543 09, 35543 14, 35543 15, 35543 22, 35543 23, 35543 24, 35543 26, and 35543 00 may not be comparable to 1987 data.
- ⁷For 1982, data for product code 35543 02 were combined with product code 35543 05 to avoid disclosing data for individual companies.
- ⁸For 1982, product code 35543 03 was not collected separately but was included with product code 35543 05.
- ⁹For 1982, product codes 35543 11, 35543 12, 35543 13, and 35543 14 were not collected separately but were included with product code 35543 15.
- ¹⁰For 1982, product code 35543 21 was not collected separately but was included with product code 35543 26.
- ¹¹For 1982, data for product codes 3555-- -- and 35558 -- have been revised. These product codes were published in 1982 as 3555-- -- and 35557 --, respectively, and included roll covering, rubber and plastics, graphic arts (product code 35557 72) and printers' blankets (product code 35557 76). For 1987, roll covering and printers' blankets are classified in SIC industry 3069, Fabricated Rubber Products, N.E.C.
- ¹²For 1982, product codes 35551 35, 35551 32, and 35551 36 were combined to avoid disclosing data of individual companies.
- ¹³For 1982, product code 35558 00 included lithographic plates. For 1987, lithographic plates are included in SIC industry 2796, Platemaking and Related Services.
- ¹⁴SIC industry 3556, Food Product Machinery, is published as a separate industry for the first time in 1987. It was part of SIC industry 3551 in 1982. In 1982, SIC industry 3551 included packing, packaging, and bottling machinery which are classified in SIC industry 3565, Packaging Machinery, in 1987. In 1982, data for product codes 35561 -- and 35562 -- were published under product codes 35511 -- and 35512 --, respectively.
- ¹⁵For 1982, data for product code 35561 02 included homogenizers but excluded sterilizers which were included in product code 35561 19. For 1987, homogenizers were collected separately under product code 35561 09.
- ¹⁶For 1982, data for product codes 35561 08, 35561 11, and 35561 21 were not collected separately but were included with product code 35561 19.
- ¹⁷For 1982, data for product code 35562 65 included only dough mixers. Data for dividers and molders were included with product code 35562 91.
- ¹⁸For 1982, data for product code 35562 85 were not collected separately but were included with product code 35562 91.
- ¹⁹For 1982, data for product code 35563 -- have been revised. This product code was published in 1982 as 35513 -- and included bottle washers and sterilizers under product code 35513 67. Also, for 1982, data for product 35563 21 include an undetermined amount of data for parts and attachments for bottle washers and sterilizers which cannot be separated. Therefore, the 1982 data for product codes 35563 21 are not directly comparable to the 1987 data. For 1987, bottle washers and sterilizers and related parts and attachments are classified in SIC industry 3565, Packaging Machinery.
- ²⁰For 1982, data for product codes 35563 01, 35563 04, 35563 05, 35563 06, 35563 07, 35563 09, 35563 12, and 35563 14 were not collected separately but were included with product code 35563 15.
- ²¹For 1982, data for product code 3559-- -- have been revised. In 1982, gas or air liquefying machinery, product code 35591 07; automotive maintenance equipment, product code 35597 --; and industrial sewing machinery, product codes 35599 88, 35599 89, and 35599 90 were classified in SIC industries 3569, General Industrial Machinery, N.E.C., 3549, Metalworking Machinery, N.E.C., and 3636, Sewing Machines.
- ²²Data for 1982 do not include gas or air liquefying machinery, product code 35591 07, and, therefore, are not comparable to 1987 data. In 1982, these products were classified in SIC industry 3569, General Industrial Machinery, N.E.C., and were not collected separately.
- ²³For 1987, data for product code 35594 17 are combined with product code 35594 21 to avoid disclosing data for individual companies.
- ²⁴In 1982, data for product code 35596 -- were included in product code 35599 --.
- ²⁵For 1982, data for product codes 35596 01, 35596 03, 35596 05, 35596 07, 35596 90, 35596 11, 35596 13, 35596 15, 35596 17, 35596 19, 35596 21, 35596 23, 35596 25, 35596 27, 35596 29, 35596 31, 35596 33, 35596 35, 35596 39, 35596 41, 35596 43, 35596 45, 35596 47, 35596 49, and 35596 51 were not collected separately but were included with product code 35596 00.
- ²⁶For 1987, data for product codes 35596 29 and 35596 31 are combined with product code 35596 33 to avoid disclosing data for individual companies.
- ²⁷For 1982, data for product code 35597 11 were not collected separately but were included with product code 35597 09.
- ²⁸For 1982, data for product codes 35599 13, 35599 15, 35599 17, 35599 19, 35599 22, 35599 25, 35599 27, 35599 29, 35599 47, 35599 49, 35599 51, 35599 65, 35599 67, 35599 69, 35599 71, 35599 80, 35599 81, 35599 82, 35599 83, 35599 85, 35599 86, 35599 87, 35599 92, 35599 93, 35599 94, 35599 95, 35599 96, and 35599 97 were not collected separately but were included with product code 35599 99.
- ²⁹For 1982, data for product codes 35599 33 and 35599 37 were combined to avoid disclosing data for individual companies.
- ³⁰For 1982, separate data for product code 35599 90 were not available. These data were included with data under product code 36362 85 which included parts and attachments for both household and industrial service machines.

Table 3. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3552, TEXTILE MACHINERY					
	Materials, parts, containers, and supplies	(X)	455.9	(X)	365.5
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons..	(S)	14.4	(S)	19.1
331012	Sheet and strip do..	(S)	12.0	(S)	8.5
331015	Structural shapes do..	(S)	6.7	15.3	7.0
331017	Wire and wire products do..	(S)	21.4	(S)	15.1
331019	All other carbon steel mill shapes and forms do..	(S)	14.2	6.4	6.6
331020	Alloy steel, except stainless do..	(S)	2.0	2.5	2.4
331031	Stainless steel mill shapes and forms do..	*4.0	21.8	(S)	9.6
335105	Copper and copper-base alloy mill shapes and forms mil lb..	(S)	.5	(S)	1.4
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil mil lb..	(S)	1.7	(S)	4.6
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do..	(S)	2.4	**6.6	5.1
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do..	(S)	3.7	(S)	5.9
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons..	(S)	22.0	(S)	24.3
332045	Steel do..	(S)	5.0	*1.0	1.8
336005	Aluminum and aluminum-base alloy mil lb..	(S)	4.9	*6.1	8.7
336003	Other nonferrous do..	(S)	2.0	(S)	4.8
362120	Integral horsepower electric motors and generators (1 hp or more) thousands..	(S)	8.9	**73.9	9.4
	Bearings, including mounted and unmounted:				
356218	Ball (X)	5.4	(X)	7.2	
356201	Roller (X)	3.5	(X)	5.0	
356810	Plain bearings and bushings (X)	2.4	(X)	3.6	
356023	Speed reducers, gears, drives, and other mechanical power transmission equipment, except bearings (X)	13.2	(X)	14.3	
308006	Fabricated plastics products, except gaskets (X)	5.5	(X)	4.8	
360101	Electrical control and distribution equipment, including coils, switches, relays, regulators, motor controls, etc. (X)	26.6	(X)	17.7	
970099	All other materials and components, parts, containers, and supplies consumed (X)	132.3	(X)	88.7	
971000	Materials, parts, containers, and supplies, n.s.k. ² (X)	123.4	(X)	90.9	
INDUSTRY 3553, WOODWORKING MACHINERY					
	Materials, parts, containers, and supplies	(X)	354.0	(X)	(³)
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons..	(S)	14.6	(NA)	(NA)
331012	Sheet and strip do..	(S)	27.5	(NA)	(NA)
331013	Plates do..	(S)	5.0	(NA)	(NA)
331053	All other carbon steel mill shapes and forms do..	(S)	4.5	(NA)	(NA)
331020	Alloy steel, except stainless do..	(S)	3.4	(NA)	(NA)
331031	Stainless steel do..	(S)	.3	(NA)	(NA)
335001	Aluminum and aluminum-base alloy mil lb..	(D)	(D)	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons..	(S)	14.5	(NA)	(NA)
332045	Steel do..	(S)	3.7	(NA)	(NA)
336005	Aluminum and aluminum-base alloy mil lb..	(S)	6.6	(NA)	(NA)
336006	Copper and copper-base alloy do..	(S)	.2	(NA)	(NA)
336008	Other nonferrous do..	(D)	(D)	(NA)	(NA)
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp), excluding timing motors thousands..	(S)	18.2	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp and larger) do..	(S)	15.1	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball (X)	4.7	(NA)	(NA)	
356201	Roller (X)	4.2	(NA)	(NA)	
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets (X)	1.8	(NA)	(NA)	
308006	Fabricated plastics products, except gaskets (X)	4.1	(NA)	(NA)	
349271	Fluid power (hydraulic and pneumatic) valves (X)	2.5	(NA)	(NA)	
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies (X)	.8	(NA)	(NA)	
356921	Filters for hydraulic fluid power systems (X)	.2	(NA)	(NA)	
	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators (X)	3.2	(NA)	(NA)	
359302	Hydraulic and pneumatic equipment (except pumps, compressors, cylinders, and rotary actuators) (X)	1.2	(NA)	(NA)	
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions thousands..	(S)	2.1	(NA)	(NA)
357004	Electronic computing equipment and parts (X)	2.7	(NA)	(NA)	
360101	Electrical transmission, distribution, and control equipment, etc. (except numerical controls) (X)	3.6	(NA)	(NA)	
362522	Numerical controls for woodworking machinery and equipment (X)	3.7	(NA)	(NA)	
265001	Paperboard containers, boxes, and corrugated paperboard 1,000 s tons..	(S)	9.2	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies (X)	82.9	(NA)	(NA)	
971000	Materials, parts, containers, and supplies, n.s.k. ² (X)	107.4	(NA)	(NA)	

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 3554, PAPER INDUSTRIES MACHINERY					
	Materials, parts, containers, and supplies -----	(X)	670.6	(X)	479.2
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons--	(S)	15.8	35.1	24.8
331013	Plates ----- do--	(S)	17.0	31.1	21.1
331004	All other ----- do--	(S)	7.5	14.3	18.6
331020	Alloy steel, except stainless ----- do--	(S)	9.1	16.0	16.8
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons--	(S)	19.3	*4.0	15.0
331050	All other stainless steel mill shapes and forms ----- do--	*5.2	10.7	**5.1	13.3
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- mil lb--	(S)	.4	2.9	10.7
335143	Plate, sheet, and strip, including military cups and discs ----- do--	*.2	.7	2.3	4.7
335152	Pipe and tube ----- do--	(S)	2.6	5.1	15.5
331051	Pig iron, excluding silvery iron ----- 1,000 s tons--	]		23.2	13.4
190023	Iron and steel scrap, excluding home scrap ----- do--				
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons--	(S)	22.9	17.8	27.8
332045	Steel ----- do--	(S)	15.7	*10.6	24.2
336005	Aluminum and aluminum-base alloy ----- mil lb--	(S)	1.6	**1.0	2.6
336006	Copper and copper-base alloy ----- do--	(S)	2.7	*2.0	3.5
336008	Other nonferrous ----- do--	(S)	11.9	.4	.8
362120	Integral horsepower electric motors and generators (1 hp or more) ----- thousands--	(S)	14.4	29.1	18.7
349271	Fluid power (hydraulic and pneumatic) valves -----	(X)	3.5	(X)	3.7
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies -----	(X)	5.5	(X)	3.0
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands--	(S)	4.5	**10.9	4.7
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	6.7	(X)	7.8
356201	Roller -----	(X)	12.3	(X)	12.6
356810	Plain bushings and bearings -----	(X)	5.3	(X)	6.0
356601	Speed changers, gears, and industrial high-speed drives -----	(X)	18.4	(X)	17.2
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators -----	(X)	3.8	(X)	3.7
360101	Electrical transmission, distribution, and control equipment -----	(X)	25.3	(X)	13.6
306902	Fabricated rubber products, except tires, tubes, hose, belting, and gaskets -----	(X)	10.7	(X)	6.3
970099	All other materials and components, parts, containers, and supplies -----	(X)	291.6	(X)	135.4
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	130.3	(X)	33.7
INDUSTRY 3555, PRINTING TRADES MACHINERY					
	Materials, parts, containers, and supplies -----	(X)	*1 072.6	(X)	(³)
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons--	**28.6	23.7	(NA)	(NA)
331012	Sheet and strip ----- do--	(S)	5.8	(NA)	(NA)
331013	Plates ----- do--	**22.8	17.4	(NA)	(NA)
331004	All other ----- do--	(S)	3.4	(NA)	(NA)
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons--	*3.4	4.5	(NA)	(NA)
331029	All other alloy steel mill shapes and forms ----- do--	(S)	1.7	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons--	*1.5	2.9	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do--	(S)	2.3	(NA)	(NA)
	Copper and copper-base alloy:				
335728	Bare wire, for electrical conduction only ----- mil lb--	(S)	.5	(NA)	(NA)
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- do--	(S)	.2	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do--	(S)	(Z)	(NA)	(NA)
335152	Pipe and tube ----- do--	*.3	.2	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb--	10.2	17.6	(NA)	(NA)
335006	All other aluminum mill shapes and forms (extruded shapes, wire, rod, bar, powder, pipe tubing, etc.) ----- do--	(S)	3.9	(NA)	(NA)
335792	Insulated copper wire and cable, except magnet wire (quantity of copper content) ----- do--	(S)	.3	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons--	(S)	42.9	(NA)	(NA)
332045	Steel ----- do--	(S)	5.1	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb--	(S)	6.5	(NA)	(NA)
336003	Other nonferrous, except aluminum ----- do--	*1.4	1.4	(NA)	(NA)
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp), excluding timing motors ----- thousands--	(S)	18.6	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp and larger) ----- do--	(S)	13.5	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	10.0	(NA)	(NA)
356201	Roller -----	(X)	8.0	(NA)	(NA)
356810	Plain bearings and bushings -----	(X)	2.0	(NA)	(NA)
356601	Speed changers, gears, and industrial high-speed drives -----	(X)	39.6	(NA)	(NA)
360101	Electrical transmission, distribution, and control equipment -----	(X)	119.0	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies consumed -----	(X)	441.8	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	281.6	(NA)	(NA)

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982—Con.**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3556, FOOD PRODUCTS MACHINERY				
	Materials, parts, containers, and supplies -----	(X)	³ 710.7	(X)	(²)
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	11.8	(NA)	(NA)
331012	Sheet and strip ----- do..	(S)	23.8	(NA)	(NA)
331013	Plates ----- do..	(S)	14.9	(NA)	(NA)
331015	Structural shapes ----- do..	(S)	3.6	(NA)	(NA)
331019	All other carbon steel mill shapes and forms ----- do..	(S)	3.0	(NA)	(NA)
331020	Alloy steel, except stainless ----- do..	(S)	3.6	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	(S)	35.3	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..	(S)	25.3	(NA)	(NA)
335105	Copper and copper-base alloy mill shapes and forms ----- mil lb..	(S)	1.1	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	6.6	(NA)	(NA)
335012	All other (extruded shapes, wire, rod, bar, powder, tubing, etc.) ----- do..	**10.3	8.2	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	15.5	(NA)	(NA)
332045	Steel ----- do..	(S)	13.7	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	10.2	(NA)	(NA)
336006	Copper and copper-base alloy ----- do..	(S)	1.7	(NA)	(NA)
336008	Other nonferrous ----- do..	(S)	(⁴)	(NA)	(NA)
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp), excluding timing motors ----- thousands..	(S)	8.4	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more) ----- do..	(S)	14.3	(NA)	(NA)
	Bearings, including mounted and unmounted:				
356218	Ball -----	(X)	5.7	(NA)	(NA)
356201	Roller -----	(X)	2.5	(NA)	(NA)
356810	Plain bearings and bushings -----	(X)	2.6	(NA)	(NA)
356601	Speed changers, drives, gears, and industrial high-speed drives -----	(X)	19.6	(NA)	(NA)
360101	Electrical transmission, distribution, and control equipment -----	(X)	19.8	(NA)	(NA)
344301	Metal tanks, heat exchangers, steam condensers and other boiler products, fabricated steel plate, and weldments -----	(X)	6.0	(NA)	(NA)
349271	Fluid power (hydraulic and pneumatic) valves -----	(X)	4.0	(NA)	(NA)
349261	Fluid power (hydraulic and pneumatic) hose or tube fittings and assemblies -----	(X)	3.1	(NA)	(NA)
359302	Hydraulic and pneumatic equipment (except pumps, compressors, valves, cylinders, and rotary actuators) -----	(X)	3.3	(NA)	(NA)
359412	Hydraulic fluid power pumps, motors, and hydrostatic transmissions ----- thousands..	(S)	4.4	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies consumed -----	(X)	⁴ 228.0	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ² -----	(X)	210.6	(NA)	(NA)
	INDUSTRY 3559, SPECIAL INDUSTRY MACHINERY, N.E.C.				
	Materials, parts, containers, and supplies -----	(X)	³ 2 868.7	(X)	(²)
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ----- 1,000 s tons..	(S)	61.6	(NA)	(NA)
331012	Sheet and strip ----- do..	(S)	50.1	(NA)	(NA)
331013	Plates ----- do..	(S)	60.3	(NA)	(NA)
331015	Structural shapes ----- do..	(S)	36.0	(NA)	(NA)
331017	Wire and wire products ----- do..	(S)	4.5	(NA)	(NA)
331019	All other carbon steel shapes and forms ----- do..	(S)	43.8	(NA)	(NA)
	Alloy steel, except stainless:				
331021	Bars and bar shapes ----- 1,000 s tons..	(S)	21.7	(NA)	(NA)
331029	All other alloy steel mill shapes and forms ----- do..	(S)	10.8	(NA)	(NA)
	Stainless steel:				
331033	Sheet and strip ----- 1,000 s tons..	(S)	24.0	(NA)	(NA)
331050	All other stainless steel mill shapes and forms ----- do..	(S)	25.3	(NA)	(NA)
	Copper and copper-base alloy:				
335102	Rod, bar, and mechanical wire, including extruded and/ or drawn shapes ----- mil lb..	(S)	8.5	(NA)	(NA)
335143	Plate, sheet, and strip, including military cups and discs ----- do..	(S)	2.4	(NA)	(NA)
335152	Pipe and tube ----- do..	(S)	5.0	(NA)	(NA)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ----- mil lb..	(S)	20.4	(NA)	(NA)
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ----- do..	(S)	7.7	(NA)	(NA)
335007	All other (wire, rolled rod and bar, powder, welded tubing, etc.) ----- do..	(S)	11.0	(NA)	(NA)
	Primary metals and scrap:				
331051	Pig iron, excluding silvery iron ----- 1,000 s tons..	(D)	(⁶)	(NA)	(NA)
190023	Iron and steel scrap, excluding home scrap ----- do..	(D)	(⁶)	(NA)	(NA)
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) ----- 1,000 s tons..	(S)	42.0	(NA)	(NA)
332045	Steel ----- do..	(S)	19.1	(NA)	(NA)
336005	Aluminum and aluminum-base alloy ----- mil lb..	(S)	21.9	(NA)	(NA)
336006	Copper and copper-base alloy ----- do..	(S)	2.8	(NA)	(NA)
336008	Other nonferrous ----- do..	*2.1	4.0	(NA)	(NA)
	Electric motors and generators:				
362115	Fractional horsepower electric motors (less than 1 hp), excluding timing motors ----- thousands..	(S)	19.5	(NA)	(NA)
362120	Integral horsepower motors and generators (1 hp or more) ----- do..	(S)	42.1	(NA)	(NA)

See footnotes at end of table.

Table 3. Materials Consumed by Kind: 1987 and 1982—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
	INDUSTRY 3559, SPECIAL INDUSTRY MACHINERY, N.E.C.—Con.				
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	12.2	(NA)	(NA)
356201	Roller	(X)	8.7	(NA)	(NA)
356810	Plain bearings and bushings	(X)	8.2	(NA)	(NA)
356601	Speed changers, gears, and industrial high-speed drives	(X)	31.4	(NA)	(NA)
345001	Bolts, nuts, screws, rivets, and screw machine products	(X)	25.8	(NA)	(NA)
344301	Metal tanks, heat exchangers, steam condensers, and other boiler-shop products; fabricated steel plate weldments	(X)	38.1	(NA)	(NA)
349402	Fabricated metal pipe, valves, and pipe fittings	(X)	23.7	(NA)	(NA)
335609	Nonferrous metal mill shapes and forms, except copper and aluminum	(S)	2.1	(NA)	(NA)
360101	Electrical transmission, distribution, and control equipment	(X)	151.3	(NA)	(NA)
346901	Metal stampings	(X)	6.9	(NA)	(NA)
356101	Pumps and pump parts	(X)	44.1	(NA)	(NA)
356301	Air and gas compressors, except refrigeration compressors	(X)	5.0	(NA)	(NA)
349271	Fluid power (hydraulic and pneumatic) valves	(X)	21.6	(NA)	(NA)
359301	Fluid power (hydraulic and pneumatic) cylinders and rotary actuators	(X)	20.7	(NA)	(NA)
359412	Fluid power (hydraulic only) fluid power pumps and motors	(X)	16.4	(NA)	(NA)
356921	Filters for hydraulic fluid power systems	(X)	3.7	(NA)	(NA)
970099	All other materials and components, parts, containers, and supplies	(X)	⁵ 859.8	(NA)	(NA)
971000	Materials, parts, containers, and supplies, n.s.k. ²	(X)	1 094.9	(NA)	(NA)

¹For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³Industry definition is new for 1987 and, therefore, 1987 data for materials consumed are not comparable to prior-year data. As a result, 1982 materials consumed data are not available.

⁴For 1987, data for material code 336008 are combined with 970099 to avoid disclosing data for individual companies.

⁵For 1987, data for material codes 190023 and 331051 are combined with material code 970099 to avoid disclosing data for individual companies.

APPENDIX

Scope and Coverage and Explanation of Terms

GENERAL

The 1987 Census of Manufactures is the 32nd census of manufacturing establishments conducted in the United States. For 1987, it was conducted as part of the economic censuses, which included the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses, under authority of title 13 of the United States Code. Title 13 specifies that an economic census be conducted every 5 years to cover years ending in 2 and 7.

SCOPE AND COVERAGE

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. All manufacturing establishments with one paid employee or more at any time during the year are covered by the census of manufactures. Therefore, a company operating at more than one location is required to file a separate report for each location. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units which service manufacturing establishments of the same company. Where these auxiliary operations are conducted at the same location as the manufacturing operation, they are usually included in the report for the operating manufacturing establishment.

Use of Administrative Records

From a universe of approximately 350,000 manufacturing establishments in the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of the small establishment nonmail cases was done on an industry-by-industry basis. A variable cutoff was used to determine those establishments for which administrative records were to be used in place of a census report. The cutoffs were selected so the administrative-record cases would account for approximately 3 percent or less of the value of shipments for the industry. These cutoffs were then adjusted so that all single-establishment companies with less than 5 employees were excluded from the mail canvass, while all establishments with more than 20 employees were included. Where establishments in the 5 to 20 employee size range were included in the mail canvass, an abbreviated census form was frequently used.

For these nonmail establishments, (and a small number of larger establishment whose reports were not received at the time the data were tabulated) data on employment, payroll, and receipts were obtained from administrative records of other government agencies rather than from census forms. The administrative-record information was then used in conjunction with industry averages to estimate the data for these establishments. The value of shipments and cost of materials were not distributed among specific products and materials but were included in the product and material "not specified by kind" (n.s.k.) categories.

EXPLANATION OF TERMS

Number of establishments and companies—A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

All employees—Includes all full-time and part-time employees on the payrolls at any time during the year. Included are all persons on paid sick leave, paid holidays, and paid vacations. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Production workers—Includes workers up through the working-supervisor level engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, guard services, product development, auxiliary production for plant's own use (e.g., power-plant), recordkeeping, and other closely associated services. Truckdrivers delivering ready-mixed concrete are also included in production workers.

Other employees—Includes nonproduction personnel, including those engaged in the following activities: supervision above working-supervisor level, sales (including driver/salespersons), sales delivery (truckdrivers and helpers), advertising, credit collection, installation and

servicing of own product, clerical and routine office functions, executive, purchasing, finance, legal, personnel (including cafeteria, etc.), professional, and technical employees.

Payroll—Includes the gross earnings for the “employees” defined above, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees’ Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production-worker hours—Covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of materials—Refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuels consumed, regardless of whether they were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or generating electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific materials consumed (table 3)—In addition to the total cost of materials which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. These inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers’ records. Establishments consuming less than a specified amount (usually \$10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records were used was estimated as “not specified by kind” (n.s.k.).

Value of shipments and other receipts—Generally refers to received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all

miscellaneous receipts such as receipts for contract work performed for others, installation and repair receipts, sale of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishment from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In a few industries, the value of production or value of work completed is used instead of value of shipments. These industries are identified in the introduction and are footnoted in table 1.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, that is, including not only the direct costs of production but also a reasonable proportion of “all other costs” (including company overhead and profit).

Shipments or production of individual products (table 2)—In the 1987 census, detailed shipment information was collected for approximately 11,000 individual products. These products are identified by a seven-digit code and are grouped into approximately 1,500 classes of products, which in turn are primary to 459 four-digit industries. Data at the five-digit product-class level have been collected each year as part of the annual survey of manufactures. Information at the seven-digit level, collected for many industries in the current industrial reports program, is not included in this table.

Value added by manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the addition of value added by merchandising operations (that is, the difference between the sales value and cost of merchandise sold without further manufacturing, processing, or assembly) plus the net change in finished goods and work-in-process inventories between the beginning and end of the year.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1), value added is adjusted only for the change in work-in-process inventories between the beginning and end of the year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

Value added avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value

added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for new plant and equipment—Establishments in operation and any known plants under construction were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments and (b) new machinery and equipment used for replacement and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude expenditures for used plant and equipment, expenditures for land, and cost of maintenance and repairs charged as current operating expenses. Data for used plant and equipment will be published in the final industry bulletin.

End-of-year inventories—Comprised of (a) finished products; (b) work-in-process; and (c) materials, supplies, fuels, etc. Beginning in 1982, respondents were asked to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method.

Therefore, 1982 through 1987 data for inventories are not strictly comparable to prior-year data.

Specialization and coverage ratios—An establishment is classified in a particular industry if its shipments of primary products of the industry exceed in value its shipments of the products of any other single industry. An establishments' shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). The following ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in table 1 and data on product shipments shown in table 2.

Specialization ratio—Represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio—Represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments, wherever classified.

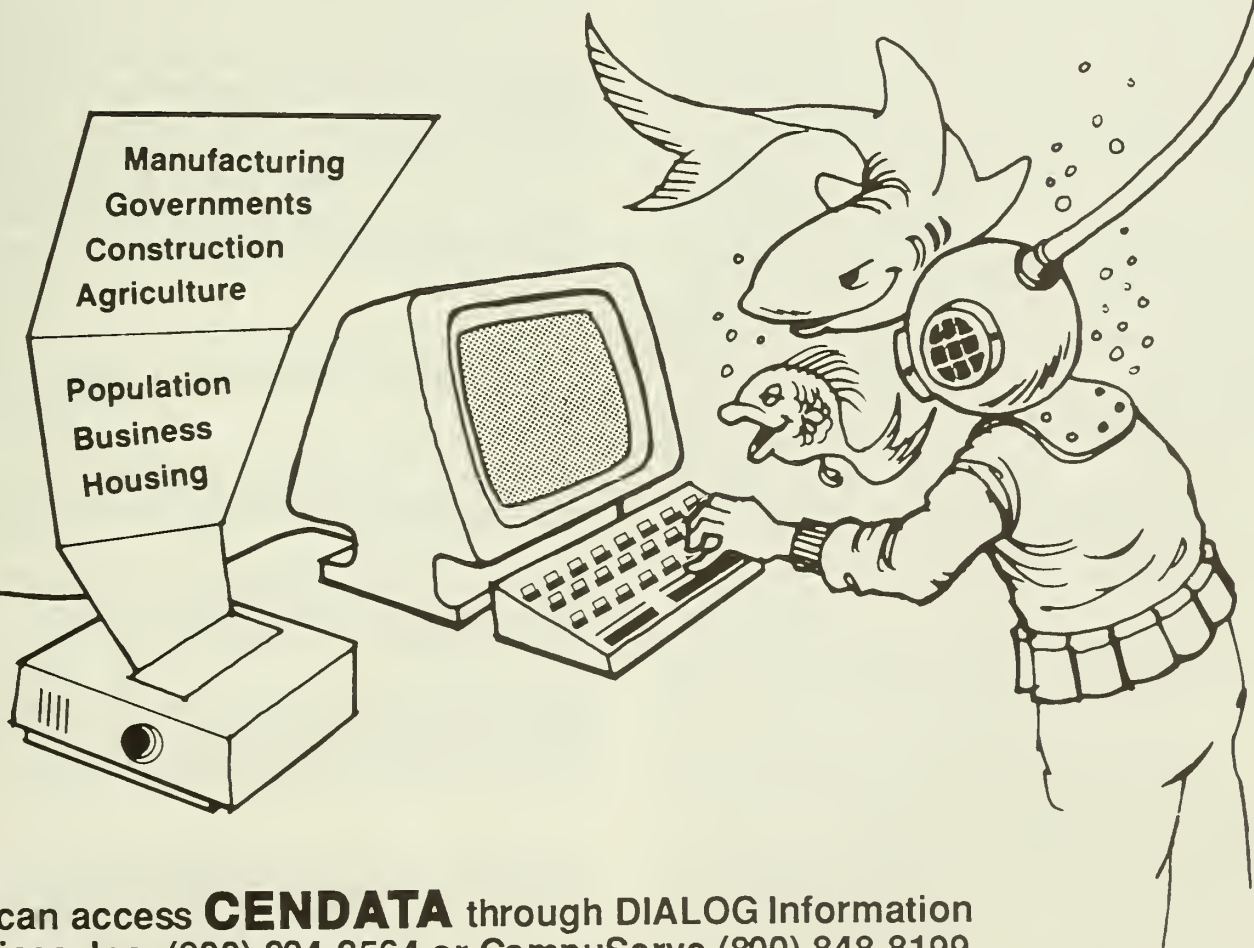


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